

QL  
640  
C78

New York, September 22, 1915. No. 22



*Published to advance the Science of cold-blooded vertebrates*

## A PECULIAR COLOR DISPLAY IN THE YELLOW GRUNT.

While at the Marine Biological Station of the Carnegie Institution at the Tortugas Islands in the Gulf of Mexico, I had many opportunities to observe the brilliant colors of the coral-reef fishes. These are seen at their best only when the fish are at liberty in their natural waters.

The yellow grunt, *Haemulon sciurus*, has the head and body broadly striped with chrome-yellow and lavender-blue. The anals and ventrals are yellow, the belly and throat white. The outside of the fish would seem to afford a sufficient display; but, as in other grunts, the interior of the mouth is brightly colored. In this species it is vermilion everywhere from the caudal margin of the breathing valves as far back as the first gill slit. The mouth is large and can be opened very wide. When so opened it appears as a conspicuous red patch.

One morning in July, 1905, I crushed a large black sea-urchin (*Diadema*) and threw it into the water. Two yellow grunts soon appeared and began to feed on it. When I first saw them they were about a foot apart and directly facing each other. Presently one of them opened its mouth very wide so as to display fully its red lining. He then swam toward the other. The second fish opened its mouth in the same way but did not move. The first kept on until the

jaws of the two touched. His mouth was a bit larger or wider open so that his jaws overlapped for an instant those of the other fish. They then separated.

During the whole of this manœuvre the two fish faced each other. To each the vivid red mouth lining of the other must be visible. To the human observer it is startlingly conspicuous. He cannot escape the impression that the fish are making a display; he might be pardoned for saying that they are bluffing. This impression is strengthened by the wide gaping of the mouth, by the facing position and by the rather deliberate approach. It is as if each were expecting the other to flee at any moment.

Such displays of conspicuous color patches are not rare among inconspicuous insects. They are thought to have been developed through natural selection and to serve the purpose of startling an enemy (Schreckfarben). In conspicuously colored insects they are probably quite as common, but are overlooked because superimposed on an already conspicuous coloration. In the grunt, the red mouth patch displayed suddenly on a background of yellow and blue stripes is to man conspicuous and startling. If seen in an insect it would undoubtedly be classified as a "Schreckfarbe." How it affects the fish's natural enemies we can hardly know.

The color patch is revealed to its fullest extent when the mouth is opened wide in the presence of an enemy. It seems to be little exposed in the usual taking of food. I have never seen it then. But the food of the species consists of crustaceans and annelids, whose visual organs, so far as we know, are unaffected by any color display. Selection need then hardly deprive the *Haemulon*s of their mouth patches in order to assure their food supply. Considered as a contrivance for bluffing enemies the mouth patch seems of doubtful advantage. It is to be expected that enemies, if affected by it, would soon become accustomed to it and be no longer startled.

In any case it helps them to see better the oral weapon with which they are threatened. It should be easier for them to meet the attack.

On the whole it seems wisest to regard the display as merely incidental to the opening of the mouth in attack and as quite devoid of biological meaning. In its effect on food it is neutral; in its effect on enemies the advantages and disadvantages seem to be pretty well balanced. The disadvantages may have rather the best of it. The analysis of the case may help to an understanding of similar displays in other forms. It suggests caution in interpreting them.

JACOB REIGHARD,  
*Ann Arbor, Michigan.*

### PIKE-FISHING INCIDENTS.

The following incidents occurred during my vacation this summer in the Adirondack Mountains:

On August 14th Dr. H—— and myself went out pike fishing on Stony Creek Pond No. 1, in Corcys. At the time the incident happened I was rowing the boat and the Doctor trolling, using a shiner for bait. A pike was struck and after some play the line came away minus bait, hook and an inch of the gut to which the hook had been attached. Another baited hook was put on and we continued around the pond. On coming a second time to the spot where the fish was lost there was another strike, and a pike a little under two pounds was safely landed in the boat.

At the first cut I made in dressing this fish out dropped a shiner with the Doctor's lost hook and inch of gut snood fastened to it. The gut had been sawed off by the pike's teeth.

A few days later while fishing in the same place the following occurred:

I was still fishing, using a live perch as bait. My first catch was a pike weighing in the vicinity of one and a half pounds. He had swallowed the perch, and,

finding it impossible to reach the hook or even to see it, I opened his belly, and finding the perch still alive, threw it into the water. While it could not right itself and swim away, it continued for some time to paddle around in a circle.

CHAS. W. MEAD,  
New York, N. Y.

### NOTES ON A FISH CAUGHT THREE TIMES.

The writer has on several occasions seen fishes bite on a hook when they have already been caught once.

In one instance on Upper Saranac Lake in the Adirondacks a yellow perch (*P. flavescens*) was caught, a worm being used as bait. The lower half of its tail was slightly deformed and this served as a mark of identification. As the writer was not after perch, the fish was tossed back uninjured.

Within about ten minutes it had been caught three times.

DWIGHT FRANKLIN,  
New York, N. Y.

### BOX TORTOISE (*Terrapene carolina*) SWIMMING A CREEK.

On May 9th, about eight o'clock in the morning, I noticed an object moving about in Darby Creek, about a mile above Addingham. It was a few feet out from the shore, and through a pair of field-glasses was seen to be a box tortoise. At this point the creek is about fifteen to twenty yards wide, and the tortoise was headed directly for the opposite shore. It swam very slowly and laboriously, only the highest part of the carapace and the head, from just below the eyes, projecting above the surface of the water. As it moved along, it bobbed up and down. After much effort, when within a few feet of landing on the oppo-

site shore, it stopped to rest a second or so, floating a short distance down stream, when it resumed its movements towards the bank. Close to the bank it stopped paddling, floated gently up on the mud, and after a few moments' rest, crawled slowly out on the muddy shore, stopping again for a rest. Five or ten minutes later it was still resting in the sun. Never having seen the box tortoise swim before, this note is offered as possibly of interest.

DELOS E. CULVER,  
Addingham, Pa.

#### NUMBER OF YOUNG PRODUCED BY CERTAIN SNAKES.

I quote the following records from my notes, trusting that they may be of some interest. All the specimens referred to were taken in Nelson County, Va.:

*Natrix septemvittata*. August 31st, 1914. Five young.

*Natrix sipedon*. I have never observed over 40 young, but have three records of this number, one each of 36, 33, and 25. Dates of birth, August 12th-October 12th.

*Heterodon platyrhinos*. August 16th, 1913. A nest of 34 eggs ploughed up in a field. They hatched August 23-27.

*Agkistrodon contortrix*. September 1, 1913, 7 young. These young snakes, though born alive, had well developed egg-teeth, which were not present in the young of either *Natrix*. They were quite evident in the young of *Heterodon*.

E. R. DUNN,  
Haverford, Pa.

#### SOME AMPHIBIANS AND REPTILES OF CECIL COUNTRY, MARYLAND.

This list represents material I have examined or collected, unless otherwise stated. Sometimes, as

at Bacon Hill, Northeast, Stony Run, etc., several collections have been made, at different seasons of the year. Though incomplete, the list includes the greater number of species found in the county, especially the commoner forms:

*Cryptobranchus alleganiensis* (Daudin). Seen at Conowingo and reported from Octoraro and Bald Friar. Occasional in the Susquehanna.

*Ambystoma maculatum* (Shaw). Reported at Conowingo, though not obtained by me.

*Plethodon erythronotus* (Green). Singerly, Bacon Hill, Northeast and Bohemia Manor. Usually locally abundant.

*Spelerpes bislineatus* (Green). Bacon Hill. Few taken.

*Spelerpes ruber* (Daudin). Bacon Hill, Northeast, Bohemia Manor and Piney Creek. Abundant in springs.

*Desmognathus fusca* (Rafinesque) Conowingo, Bacon Hill, Singerly and Piney Creek. Common.

*Bufo americanus* Holbrook. Conowingo and Porter's Bridge. Bohemia Manor at Bohemia Bridge, near Warwick and Cecilton, Bohemia Mills and Little Bohemia Creek. Northeast, Bacon Hill, Elkton and Singerly. Abundant.

*Acris gryllus crepitans* (Baird). Northeast, Bacon Hill, Stony Run, Charlestown, Elkton. Abundant. Bohemia Manor along Big and Little Bohemia Creeks. Devil's Elbow, etc. Also common at Elk Neck and Piney Creek.

*Hyla pickeringii* (Holbrook). Stony Run, Charlestown, Northeast, Bacon Hill, Singerly, Elkton, Conowingo. Common, and heard usually in the spring.

*Hyla evittata*. G. S. Miller. An adult example was obtained by Mr. Paul Lorrilliere at Georgetown on the Sassafras River, July 20, 1915. It is interest-

ing as the most northern locality in the distribution of the species. Mr. Lorrilliere writes, "Last night about seven o'clock, while casting for bass, I heard a single clear note, soon followed by several more. The man rowing me about said it was produced by a little green frog, which hung on the leaves of docks, etc., and that it had a little bag under its throat which appeared to collapse when it made its call. The only sound that appears like this call is a twang on a stretched rubber, which is quieted before it has vibrated more than a second. It can be heard a quarter of a mile or more on a still night."

*Hyla versicolor*. Le Conte. Elkton, Singerly, Northeast, Bacon Hill, Elk Neck, Little Bohemia Creek.

*Rana pipiens* Schreber. Bohemia Manor.

*Rana catesbeiana* Shaw. Elkton, Northeast, Stony Run, Conowingo, Octoraro and Elk Neck. Abundant in Bohemia Manor, along Big and Little Bohemia Creeks, Devil's Elbow, Bohemia Bridge and Bohemia Mills.

*Rana clamata* Daudin. Porter's Bridge, Conowingo, Stony Run, Charlestown, Bacon Hill, Octoraro, Piney Creek, Elk Neck, and Bohemia Manor, along Little and Big Bohemia Creeks, Devil's Elbow, Scotchman's Creek, Dike Creek, Bohemia Bridge and Bohemia Mills. Common.

*Rana palustris*, Le Conte. Porter's Bridge, Conowingo, Octoraro, Charlestown, Stony Run, Bohemia Manor and Big Bohemia Creek. Common.

*Rana sylvatica*, Le Conte. Abundant about Bacon Hill and Singerly.

*Natrix sipedon* (Linn). Octoraro, Stony Run and Elk Neck. Very abundant in Bohemia Manor, along Big and Little Bohemia Creeks, Devil's Elbow, Bohemia Mills, Bohemia Bridge and Warwick.

*Elaphe obsoletus* (Say). A large example obtained in Bohemia Manor near Bohemia Mills. Also seen near Bohemia Bridge.

*Coluber constrictor* (Linn). Little Bohemia Creek, Bacon Hill, Singerly, Stony Run and Devil's Elbow.

*Thamnophis sauritus* (Linn). Bacon Hill and reported from near Devil's Elbow in Bohemia Manor.

*Thamnophis sirtalis* (Linn). Elkton, Singerly, Bacon Hill, Warwick and Stony Run.

*Lampropeltis doliiatus* (Linn). Stony Run.

*Heterodon platirhinos* (Latreille). Bohemia Mills, Bacon Hill, Singerly. Bohemia Bridge and near Warwick.

*Sceloporus undulatus* (Latreille). Elk Neck, Bacon Hill, Singerly, Warwick.

*Chelydra serpentina* (Linn). Big and Little Bohemia Creeks, Bohemia Bridge, Conowingo, Elkton, Bacon Hill, Northeast, Singerly, Conowingo.

*Kinosternon pensylvanicum* (Gmelin). Big and Little Bohemia Creeks, Bohemia Bridge and Elk Neck. Common.

*Pseudemys rubriventris* (Le Conte). Seen along the Little Bohemia Creek, though not collected.

*Chrysemys picta* (Schneider). Little and Big Bohemia Creeks, Bohemia Mills, Elk Neck, Conowingo and Octoraro.

*Clemmys guttata* (Schneider). Bacon Hill and Northeast.

*Terrapene carolina* (Linn). Warwick, Devil's Elbow, Bohemia Bridge, Little Bohemia Creek, Bohemia Mills, Bohemia Bridge, Piney Creek, Elk Neck, Elkton, Northeast, Bacon Hill, Singerly, Conowingo and Octoraro.

HENRY W. FOWLER,  
Philadelphia, Pa.



